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STATUS OF THE CLAIMS

1. (Original) An immobilized catalytic system comprising

a carrier layer comprising a catalytic entity mixed with a neutral or anionic carrier polymer; and

a screening layer over said carrier layer, wherein said screening layer comprises a matrix of a cationic polymer, wherein said cationic polymer matrix is permeable to molecules processed by, produced by or acted upon by said catalytic entity but not permeable to said catalytic entity, and wherein any counter ion to said neutral or anionic carrier polymer is not said cationic polymer and any counter ion to said cationic polymer is not said neutral or anionic carrier polymer.

2. (Original) The catalytic system of claim 1, wherein the form of said system is selected from the group consisting of round discs, thin films, microfibers, microcapsules, nanocapsules, microspheres and nanospheres.

3. (Original) The catalytic system of claim 1, wherein said catalytic entity is selected from the group consisting of proteins, antibodies, ribonucleic acids, RNA aptamers, metal catalytic systems or other chemical entities, cellular components, whole cells, tissues and microorganisms.

4. (Original) The catalytic system of claim 1, wherein said neutral or anionic carrier polymer is selected from the group consisting of neutral or anionic polysaccharides, polyvinyl derivatives, polymethacrylates, polyalkylene oxides or glycols,

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anionic polyalkylene oxides or glycols, polycarboxylic acids, anionic surfactants, anionic phospholipids, carboxyalkylcelluloses and mixtures thereof.

5. (Original) The catalytic system of claim 4, wherein said neutral or anionic carrier polymer is selected from the group consisting of alginate, hyaluronate, poly(vinyl alcohol), poly(hydroxypropyl methacrylate), carboxymethylcellulose, acid-modified polyethylene glycol, acid-modified polyethylene oxide, heparin, dextran sulfate, methoxypoly(ethylene glycol) sulfonate and mixtures thereof.

6. (Original) The catalytic system of claim 1, wherein said neutral or anionic carrier polymer is cross-linked with a cross-linking agent.

7. (Original) The catalytic system of claim 6, wherein said cross-linking agent is a covalent cross-linking agent.

8. (Original) The catalytic system of claim 6, wherein said cross-linking agent is an ionic cross-linking agent.

9. (Original) The catalytic system of claim 1, wherein said cationic polymer is selected from the group consisting of chitosan and other water-soluble chitin derivatives, cationic cellulose derivatives, cationic polyacrylates and mixtures thereof.

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10. (Original) The catalytic system of claim 1, wherein said matrix is formed from said cationic polymer by crosslinking with a covalent crosslinking agent.

11. (Original) The catalytic system of claim 10, wherein said covalent crosslinking agent is selected from the group consisting of dialdehydes, dicarboxylic acids and salts thereof, diisocyanates, epichlorohydrin and benzoquinone.

12. (Original) The catalytic system of claim 1, wherein said matrix is formed from said cationic polymer by crosslinking with an ionic crosslinking agent.

13. (Original) The catalytic system of claim 12, wherein said ionic crosslinking agent is selected from the group consisting of salts containing divalent anions and salts containing trivalent anions.

14. (Original) The catalytic system of claim 13, wherein said divalent or trivalent anions are sulfates, phosphates, citrates, or tripolyphosphates.

15. (Withdrawn) A microencapsulated catalytic system comprising

a central core comprising a catalytic entity mixed with a neutral or anionic carrier polymer, wherein said catalytic entity is a macromolecule, an organelle or a whole cell; and

an outer shell surrounding said core, wherein said outer shell comprises a matrix of a cationic polymer, wherein said cationic polymer matrix is permeable to molecules less than 20,000

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daltons and not permeable to said catalytic entity, and wherein any counter ion to said neutral or anionic carrier polymer is not said cationic polymer and any counter ion to said cationic polymer is not said neutral or anionic carrier polymer.

16. (Previously Presented) The catalytic system of claim 24, wherein said central core is liquid.

17. (Previously Presented) The catalytic system of claim 24, wherein said central core is solid.

18. (Previously Presented) The catalytic system of claim 24, wherein said catalytic entity is an enzyme.

19. (Previously Presented) The catalytic system of claim 24, wherein said catalytic entity is a cellular component.

20. (Previously Presented) The catalytic system of claim 24, wherein the form of said microencapsulated system is selected from the group consisting of microcapsules, nanocapsules, microspheres and nanospheres.

21. (Withdrawn) A method of making, microencapsulated catalytic system, said method comprising the steps of:

providing an aliquot of a catalytic entity, wherein said catalytic entity is a macromolecule, an organelle or a whole cell;

mixing said catalytic entity with a solution of a neutral or anionic carrier polymer to form a loaded carrier polymer solution;

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delivering drops of said loaded carrier polymer solution into a cross-linking solution for said neutral or anionic carrier polymer, whereby microspheres of cross-linked loaded carrier polymer are formed;

isolating said microspheres of cross-linked loaded carrier polymer;

suspending said microspheres in a solution of a cationic polymer, whereby said cationic polymer solution coats said microspheres; and

delivering drops of said suspended, coated microspheres into a cross-linking solution for said cationic polymer, whereby microspheres of said immobilized catalytic system are formed.

22. (Withdrawn) The method of claim 21, wherein said neutral or anionic carrier polymer is an alginate salt,

said cross-linking solution for said neutral or anionic carrier polymer is a solution of a calcium salt;

said cationic polymer is chitosan; and

said cross-linking solution for said cationic polymer is a solution of a phosphate salt, whereby said resulting microspheres of said immobilized catalytic system comprise a liquid central core mixed with said catalytic entity and said liquid central core is surrounded by a semi-permeable outer shell.

23. (Withdrawn) The method of claim 21, wherein said neutral or anionic carrier polymer is an alginate salt,

said cross-linking solution for said neutral or anionic carrier polymer is a solution of a barium salt;

said cationic polymer is chitosan; and

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said cross-linking solution for said cationic polymer is a solution of a phosphate salt, whereby said resulting microspheres of said immobilized catalytic system comprise a solid central core mixed with said catalytic entity and said solid central core is surrounded by a semi-permeable outer shell.

24. (Previously Presented) The catalytic system of claim 1, wherein said carrier layer comprises a central core and wherein said screening layer comprises an outer layer surrounding and microencapsulating said core.

25. (Previously Presented) The catalytic system of claim 24, wherein said catalytic entity in said central core is a macromolecule, an organelle or a whole cell.

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